



Notes From Underground

An update on source water protection and underground pollution control from the U.S. Environmental Protection Agency (EPA) Pacific Southwest/Region 9, serving Arizona, California, Hawaii, Nevada, Native American Tribes in the Region, and the Pacific Islands.

Fall 2002
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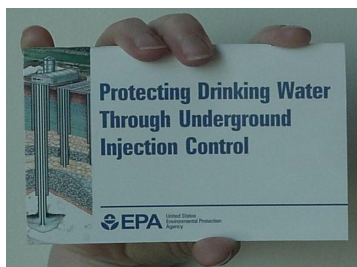
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NEW FROM EPA:

EPA's Water Office has a new look on its Website. Go to www.epa.gov/safewater to learn more about how EPA, with its many partners, protects public health by ensuring safe drinking water and protecting ground water.

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"Protecting Drinking Water Through Underground Injection Control," is a pocket-sized guide to the five classes of injection wells and a list of regional/state UIC contacts. For free copies, contact Tony Capinpin at capinpin.tony@epa.gov.

Bentonite* Plugging - "Showing" Soon at a Well Near You

The full spectrum of underground injection control (UIC) well responsibilities includes planning, drilling, construction, operation and maintenance, and lastly, *plugging*. When considering environmental standards and concerns, the plugging phase is the most critical.

When the useful life of an injection well is over, a well owner/operator is required by Federal regulation to properly plug and abandon the well. It should be plugged in a manner that will be permanent and does not allow fluid movement between geologic formations. Properly plugging an underground injection well is a concern shared by industrial groups and regulatory agencies. A well is defined as any bored, drilled or a driven shaft whose depth is greater than the largest surface dimension; or, a dug hole whose depth is greater than the largest surface dimension, or, an improved sinkhole; or, a subsurface fluid distribution system.

Conventional plugging for the deeper classes of UIC wells usually involves a rig and crew, cementing equipment and other incidentals. The entire process can last several days and the expense can add up in areas with many wells. Any cost-saving measures that are environmentally sound have obvious benefits. While new techniques are few, there is one that well owners/operators should know about. It uses compressed bentonite - in pellet form.

The bentonite pellets, which are shaped and sized like charcoal barbecue briquettes, are dropped to free-fall down the well to form the bottom of the plug. A predetermined amount of pellets is inserted into the well to settle and stack up to a point where the top of the plug is formed. With time, the pellets hydrate and swell through hydration pressure to eliminate any free space within the finished plug. A bridge plug or a similar device is placed in the well for the next plug, followed by a prescribed amount of pellets, and so on until the last plug is set at the top of the hole.

This method of using compressed bentonite has undergone numerous tests, including efforts to assess its properties, behavior and performance under differing environmental conditions. While these details are beyond the scope of this article, here is a partial list of the advantages, disadvantages, limitations and possible applications.

Advantages:

- Flexibility and adaptability to accommodate disturbances with minimal or no compromise.
- Low permeability and good chemical stability.
- Provides an economical alternative to other plugging options.
- Plugs can be easily drilled for well re-entry.

** Disclaimer: Any mention of trade names, products or services does not constitute endorsement by EPA or the federal government. Information presented is for compliance assistance only. Each situation is unique. Site-specific determinations should be made by qualified professionals. All wells owners/operators must comply with the federal regulations 40 CFR §144.12 and §146.10 when plugging and abandoning wells.*



Bentonite pellets being used to set a plug in a well.

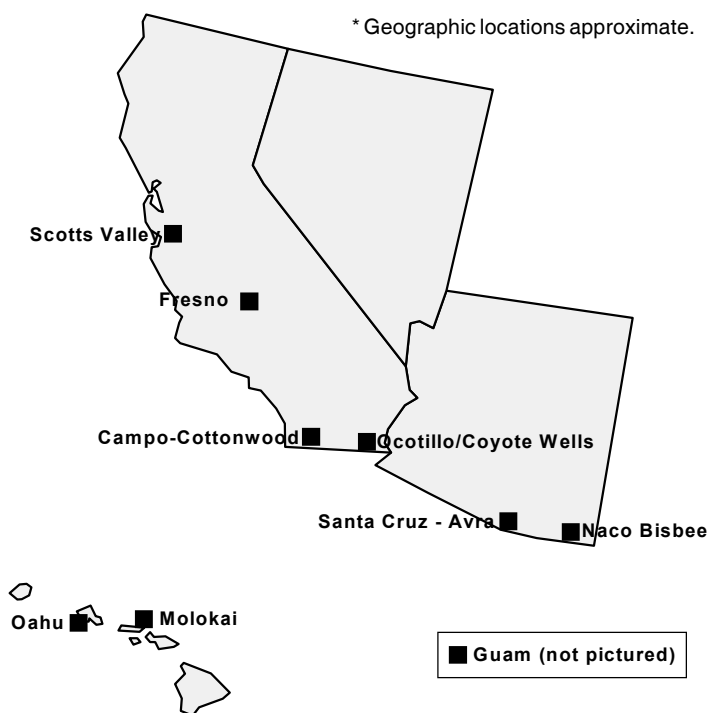
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Sole Source Aquifer Program in EPA, Pacific Southwest

Sole Source Aquifer designations are used by communities to help prevent contamination of ground water from federally funded projects. They also can serve as a mechanism to increase public awareness of ground water protection. EPA's Sole Source Aquifer (SSA) Program was established under Section 1424(e) of the Safe Drinking Water Act (SDWA).

Sole Source Aquifer Designation. A sole source aquifer is an underground water supply designated by the EPA as the "sole or principal" source of drinking water for a specific area. In order to be designated a sole source, an aquifer must supply more than 50% of a community's drinking water and it must be the only available local or regional source of drinking water.

Federal regulations (40 CFR Part 149) to carry out the sole source aquifer program were first proposed in 1977 for the Edwards Underground reservoir in San Antonio, Texas. These regulations guided EPA in subsequent SSA designations. At present, there are nine sole source aquifers in EPA's Pacific Southwest/Region 9 (see map below).



A sole source aquifer designation can be requested by submitting a petition to EPA. A petition must contain sufficient technical information for EPA to evaluate whether the aquifer meets criteria for designation. A petition can be submitted by any individual, corporation, association, federal, state or

local agency. The SSA Designation Petitioner Guidance document provides more information about preparing and submitting a petition, and is available from EPA Regional Offices.

The determination of aquifer boundaries can be challenging. These boundaries should include the surface area above the aquifer and its recharge area. Some sole source aquifers are extremely large and can cross state lines. For example, the Eastern Snake River Aquifer covers 10,000 square miles and includes portions of Idaho, Nevada, Utah and Wyoming.

Use of a Sole Source Aquifer Designation. A SSA designation provides an additional level of federal protection that benefits all users of the aquifer, not just the petitioners. According to the Safe Drinking Water Act (SDWA), projects that receive federal financial assistance are subject to EPA review and approval. The SSA program requires that all development projects receiving federal financial support (loans or grants) that are located in designated SSA areas must be assessed by EPA for their potential to degrade ground water quality in the SSA.

If a project does have such potential, it must be modified, or federal funding can be denied. EPA's Pacific Southwest/Region 9 reviews approximately 50 such projects each year. Projects have included slaughter houses, amusement parks, and bridge replacements.

When area-wide drinking water source protection is the goal, sole source aquifer status is an important factor in planning. Partnerships built during the petition and project review process can be utilized in local team-building efforts which are a crucial part of protection planning.

For more information. Contact Hillary Hecht, EPA Pacific Southwest/Region 9 Ground Water Office at 415-972-3530 or email hecht.hillary@epa.gov or visit www.epa.gov/safewater/ssanp.html.

Class V Cesspools and Motor Vehicle Waste Disposal Wells Banned, but What About Other Types?

EPA has determined that existing Federal Underground Injection Control (UIC) regulations are adequate to prevent certain Class V (Five) wells from endangering underground sources of drinking water, so no new rulemaking is necessary at this time. Examples include industrial, storm water, agricultural drainage and large-capacity septic systems. The Federal requirements do not preclude a State or local government from establishing more stringent requirements.

EPA published its Final Determination on the Class V Rule in the Federal Register, June 7, 2002 (www.access.gpo.gov/)

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Continued from page 2: No new Class V regulations

su_docs/fedreg/frcont02.html). This determination addresses all Class V well types not included in the December 7, 1999 rule affecting large-capacity cesspools and motor vehicle waste disposal wells.

EPA's UIC program will continue to collect inventory information, conduct inspections, educate facility owners and operators on their obligations under the UIC regulations, and assess injection practices. The outcome of any given assessment may be authorization by rule, a request for additional information, requiring the facility to apply for a general, area, or site specific permit, or requiring closure of a well. This determination does not preclude future action under EPA's UIC authority if the agency determines that additional regulatory action is needed.

For general information about the UIC program, go to www.epa.gov/safewater/uic, contact the Safe Drinking Water Act Hotline at 1-800-426-4791, or email Hotline-sdwa@epa.gov. For specific to EPA's Pacific Southwest/Region 9, contact Elizabeth Janes at 415-972-3537, or email: janes.elizabeth@epa.gov.

*Examples of **Worst Management Practices** for Class V wells.*

Wrong: Used oil runs into Class V shallow disposal well, accelerated by steam cleaner and soap.



Below: Dirty parts leak oil, fuel, and metals onto sandy soil, in an area exposed to storm water. Soil and ground water contamination is the likely result.



Tribal Corner



Who Regulates UIC Wells on Tribal Lands? The 1986 Safe Drinking Water Act (SDWA) enables federally-recognized tribes to assume primacy for the UIC program. For tribes that do not obtain UIC primacy, EPA directly carries out the program and regulates these types of wells.

What is Underground Injection? Underground injection is the technology of placing fluids underground through wells or other similar conveyance systems. The fluids may be water, wastewater or water mixed with chemicals.

Goal of the UIC Program: To protect public health by preventing injection wells from contaminating Underground Sources of Drinking Water.

Common Types of Wells on Tribal Lands in EPA's Pacific Southwest/Region 9: Class V wells are the most common wells located on tribal lands in our region. Most of these Class V wells are shallow large-capacity (serves at least 20 persons) on-site wastewater disposal systems. In general, Class V wells include drywells, cesspools, and septic systems with tanks and leach fields. Class V wells can also be deep injection wells.

Federal Minimum Requirements for UIC wells. EPA's requirements cover the siting, construction, operation, maintenance, monitoring, testing, and closure of injection wells. Fluids cannot be injected if they may cause a public water system to violate drinking water standards, endanger an underground source of drinking water or otherwise adversely affect public health. All operational injection wells require authorization under general rules or specific permit. Inventory information must be submitted to EPA's Ground Water Office for UIC wells on tribal lands. Inventory information includes: 1) Facility name and location; 2) Name and address of legal contact; 3) Ownership of property; 4) Nature and type of injection well; 5) Operating status of injection well.

For more information or to obtain inventory forms. Contact Lisa Penaska, Ground Water Office Tribal Contact, at 415-972-3544 or visit www.epa.gov/safewater/uic.html.

Source Water Assessment and Protection

The Water Education Foundation, through a grant from EPA, produced a source water assessment and protection guidance document, *Protecting Drinking Water: A Workbook for Tribes* (July 2000). Copies are available on request or at www.water-ed.org/specialprojects.asp.

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Disadvantages:

- Cannot be set by pumping or be "squeezed", they can only be placed.
- Placement must involve a deliberate technique due to a potential of premature bridging.
- Poor compressive strength.
- Pressure limitations.

Limitations. EPA regulations (40 CFR §146.10) require operators of Class I and II wells to plug wells using cement as the plugging agent. This prohibits the use of compressed bentonite as the sole plugging agent. EPA's UIC Technical Workgroup is conducting an examination of this method and may revise its guidance in the future.

Other Applications. Compressed bentonite may be an option for plugging Class III and V wells, which are usually shallow, situated in low-pressure environments expected to be geologically calm and free of disturbances. Other candidates may include the shallow well groups of public and private drinking water wells and those used in EPA's CERCLA (Superfund) or RCRA (waste) programs, in addition to some oil and gas production wells. Check applicable regulations first.

For more information. Contact George Robin at 415-972-3532, or email robin.george@epa.gov.

Notes From Underground

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San Francisco, CA 94105

OFFICIAL BUSINESS - PENALTY FOR PRIVATE USE \$300

Upcoming Events

September 16-19, 2002: UIC Annual Inspector Training Course in Denver, CO. For information, contact Kate Rao at rao.kate@epa.gov.

September 18 - 19, 2002: Groundwater Resource Association Annual Conference, "Sustaining Groundwater Resources: The Critical Vision" in Newport Beach, Calif. For information, visit www.grac.org.

September 21-25, 2002: Ground Water Protection Council (GWPC) Annual Forum in San Francisco, Calif. For information, go to www.gwpc.org.

October 23-25, 2002: 10th Annual Region 9 Tribal Conference in Reno, Nevada co-hosted with the Pyramid Lake Paiute Tribe. For information, contact Lisa Penaska at penaska.lisa@epa.gov.

November 12-13, 2002: Groundwater Resources Association Conference, "Nitrates in California Groundwater" in Fresno, Calif. For information, visit www.grac.org.

June 2-3, 2003: EPA National Source Water Protection Conference in Washington, D.C. For information, contact Kate Rao at rao.kate@epa.gov.

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